

ABSTRACT

This study aims to analyze gait patterns in military personnel using accelerometer and gyroscope sensors. In a military context, distinct walking styles, such as the "military march," play a crucial role in distinguishing military members from other individuals. By utilizing an MPU6050 sensor attached to a wearable device based on an ESP32, three-axis movement data (x, y, z) from the accelerometer and gyroscope were collected while subjects performed various walking movements. The collected data was wirelessly transmitted via Bluetooth Low Energy (BLE) to a processing device for further analysis.

The analysis aims not only to differentiate the distinctive military gait from that of civilians but also to identify differences in physical fitness levels among military subjects. The classification is based on three groups: rigid (military), normal, and weak (fatigued or less physically fit). This study applies acceleration magnitude calculations, statistical analysis, and motion variables to identify differences in gait patterns.

The results of this research are expected to contribute to the development of an automated system capable of recognizing military personnel through their gait, as well as providing valuable insights for enhancing physical training and fitness evaluation.

Kata Kunci: *Gait, Physique, Military, Sensor, Accelerometer, Gyroscope.*